**Air Quality and Weather Connections Datasheet Answer Key**

How can we know how clean and healthy the air is?

Together, we are going to find out:

* How can we measure how clean (healthy) the air is that we breathe?
* Does the air carry particulate matter (PM)?
* What should we do when the air is dirty (unhealthy)?

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| **1. Let’s figure out how air quality is measured and why it’s important to know.** |
| First, watch the [Wildfires in the West Cause Air Pollution](https://www.youtube.com/watch?v=S7SdzcII4Mo). Do a think-pair-share on what you observed:* Why do wildfires cause air pollution?
* What happens to the air when there is a wildfire?
* How do you think smoke from wildfire travels so far away?
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| The **Air Quality Index**, or **AQI** for short, is a rating system that tells us how healthy the air outside is.* Watch [Be Smoke Ready: Know the Colors of the Air Quality Index (AQI)](https://youtu.be/NMVH0R8ycbI) to learn about how air quality is measured.
* What should you do when the air outside is not healthy?
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| 1. As a class, look at the Air Quality Index chart.
* What information does it tell?
* Which colors mean the air is healthy?
* Which colors mean the air is unhealthy?

1. Use the AQI chart to help you complete the “What Color is Your Air” activity sheet for [grades 3-5](https://www.airnow.gov/publications/air-quality-flag-program-classroom-curriculum/activity-sheet-grade-3-5/).
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Results vary by data collected.

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| **2. Weather and Air Quality Data Table: Collect data at your school!** |
| **Date** | **Weather Conditions &****PM 2.5 and Ozone Levels** | **Air Quality Action Day?** |
| Day 1Date: | Wind direction: | ⃞ Clear sky⃞ Slightly hazy sky⃞ Very hazy sky | PM level: | PM color: | YesNo |
| Wind speed: | Temperature: | Ozone level: | Ozone color: |
| Day 2Date: | Wind direction: | ⃞ Clear sky⃞ Slightly hazy sky⃞ Very hazy sky | PM level: | PM color: | YesNo |
| Wind speed: | Temperature: | Ozone level: | Ozone color: |

Results vary by data collected.

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| **Date** | **Weather Conditions &****PM 2.5 and Ozone Levels** | **Air Quality Action Day?** |
| Day 3Date: | Wind direction: | ⃞ Clear sky⃞ Slightly hazy sky⃞ Very hazy sky | PM level: | PM color: | YesNo |
| Wind speed: | Temperature: | Ozone level: | Ozone color: |
| Day 4Date: | Wind direction: | ⃞ Clear sky⃞ Slightly hazy sky⃞ Very hazy sky | PM level: | PM color: | YesNo |
| Wind speed: | Temperature: | Ozone level: | Ozone color: |
| Day 5Date: | Wind direction: | ⃞ Clear sky⃞ Slightly hazy sky⃞ Very hazy sky | PM level: | PM color: | YesNo |
| Wind speed: | Temperature: | Ozone level: | Ozone color: |

Results vary by data collected.

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| **3. PM Collector: When done collecting PM data, place this grid face down over the sticky side of the PM Collector.** **Use a hand lens to count how many PM pieces are trapped in each square of the PM Collector. Record the number of pieces in section 4 of the datasheet.** |
| **1** | **2** |
| **3** | **4** |

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| **4. Let’s analyze our PM 2.5 data and PM Catcher results.** |
| Review the **Air Quality data table** in section 2 where you recorded PM 2.5 and ozone data. |
| Answers vary by data collected.1. Count the number of **PM 2.5 air quality** days for each AQI colors:
* Number of **green** days 🌝:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Total good PM air quality days: \_\_\_\_\_\_\_
* Number of **yellow** days 🙂:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Number of **orange** days 🙁:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Total bad PM air quality days: \_\_\_\_\_\_\_
* Number of **red** days 🙁:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Number of **purpl**e days 🙁:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
1. Count the number of **ozone air quality** days for each AQI colors:
* Number of **green** days 🌝:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Total good ozone air quality days: \_\_\_\_\_\_\_
* Number of **yellow** days 🙂:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Number of **orange** days 🙁:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Total bad PM air quality days: \_\_\_\_\_\_\_
* Number of **red** days 🙁:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Number of **purpl**e days 🙁:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
1. Adding PM and ozone data together, we’re there more **good air quality** days or **bad air quality** days overall? Circle your results:

**🙂 More clean, healthy air days**   **🙁 More dirty, unhealthy air days**1. Record your **PM Collector data**:
* Total number of PM pieces in square 1: \_\_\_\_\_\_\_\_\_\_\_
* Total number of PM pieces in square 2: \_\_\_\_\_\_\_\_\_\_\_
* Total number of PM pieces in square 3: \_\_\_\_\_\_\_\_\_\_\_
* Total number of PM pieces in square 4: \_\_\_\_\_\_\_\_\_\_\_
* Average number of PM pieces (add totals 1 through 4 and divide by 4): \_\_\_\_\_\_\_\_\_\_\_
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| **Class Reflection:** Share your thoughts on the following questions as a class:* What is one thing you enjoyed in learning about **Air Quality**?
* In your words, explain the connection between **haze and PM**? More haze means higher PM.
* Do you think the **wind affects the amount of PM** in the air? Yes, wind moves PM in the air. High winds can push PM out of an area. Low winds can make PM build up in an area.
* We collected data for a short time. Do you think **air quality** changes over a longer time?

Yes, air quality changes over time depending on changes in natural and human-made PM sources. Natural sources include wildfire smoke, volcanoes, dust storms, etc. and human-made sources include vehicle exhaust, fireplace smoke, factory exhaust, burning fossil fuels for energy, etc. These sources change depending on natural and human actions. |